

## THREE NEW SPECIES OF WATER SCAVENGER BEETLES OF THE GENUS *CHAETARTHRIA* FROM SOUTH AMERICA (COLEOPTERA: HYDROPHILIDAE)

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*Abstract.* — Three new species of water beetles, *Chaetarthria porknockeri* from Guyana, and *Chaetarthria ayacuchana* and *Chaetarthria gavilana* from Venezuela are described. Distinguishing characters for the three species are illustrated with pen and ink line drawings and their habitats are described. A key is provided to separate the new species from two previously described species.

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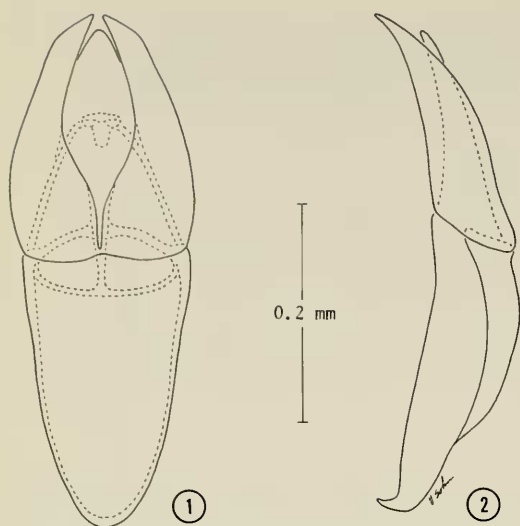
The species of *Chaetarthria* from the Western Hemisphere were revised by Miller in 1974; at that time 32 species and subspecies were known. Since Miller's revision was published three new species from Ecuador were described by Spangler (1977). During the past several years three additional new species have been collected from South America. One species was collected in December 1983 during an Earthwatch expedition to the Takutu Mountains of Guyana. A second species was collected at Puerto Ayacucho, Venezuela, in January 1985 while I participated in an expedition to the tepui Cerro de la Neblina, in southern Venezuela and the third species was collected near Puerto Ayacucho, Venezuela, in February 1986. With the description of these new taxa, 38 species are now known from the Western Hemisphere for the genus *Chaetarthria*. The three new species described below key to couplet 41 in Miller's key where *C. granulata* Miller and *C. brasilia* Miller are separated. The five species now keying to couplet 41 may be identified by using the key following the description of *C. gavilana*, new species.

*Chaetarthria porknockeri*, new species  
Figs. 1, 2

*Holotype male.* — Body form: Very convex, hemispherical. Length, 1.34 mm; greatest width, 1.1 mm, at about midlength.

*Color.* — Black dorsally except reddish brown around margins of pronotum and lateral margins of elytra. Ventral surface reddish brown with antennae and palpi light yellowish brown.

*Head.* — Punctures indistinct, extremely fine and sparse; punctures between eyes separated by 6 to 8 times their diameter; punctures slightly more dense along anterior margin of clypeus. Clypeus with lateral margins moderately arcuate and rimmed; anterior margin shallowly, broadly emarginate. Labrum more distinctly punctate than head, strongly rounded anteriorly. Eyes almost round viewed dorsally but oblong viewed ventrally; shallowly emarginate where clypeus extends into anterior margin of eye. Ventral surface of head microalutaceous behind eyes. Mentum smooth and shiny, strongly rounded apically. Submentum between maxillae microalutaceous. Antenna, 8 segmented; basal segment long, sinuous; second segment almost globular; third, fourth, and fifth segments slender, platelike; sixth, seventh, and eighth segments increasingly larger; sixth segment with few setae apically; seventh and eighth segments with long, rather dense setae; eighth segment ending in narrow apical projection. Maxillary palpus, 4 segmented; basal segment tiny; second (pseudobasal) segment almost as long as apical segment; third segment one-third as long as second segment;



Figs. 1 and 2. *Chaetarthria porknocker*, n. sp.; male genitalia. 1, Dorsal view. 2, Lateral view.

apical segment longest; pseudobasal segment when lying along stipes not attaining base of stipes. Labial palpus, 3 segmented; basal segment very small; second segment longest and bearing 2 long, golden setae near apex; apical segment about one-fourth shorter than second segment and bearing 2 long, golden, hairlike setae dorsally just before apex.

**Thorax.**—Pronotum strongly convex; sides, posterolateral angles, and anterolateral angles moderately rounded; lateral margins finely rimmed; anterior margin arcuate medially and slightly angulate behind eyes; disc essentially impunctate, punctures indistinct, very fine and sparse. Scutellum an equilateral triangle. Elytron 1.0 mm long; strongly convex; widest near midlength; distinctly rimmed along base laterally; lateral margins finely rimmed, sinuate in lateral view; punctures on disc fine, indistinct, and sparse like those on pronotum, separated by 4 to 8 times their diameter; sutural stria extending and widening from slightly before midlength to apex; sides strongly declivous, without obvious epipleura. Metathoracic wings present. Prosternum, mesosternum,

and metasternum glabrous and shiny except middle of metasternum with fine, sparse, seta-bearing punctures. Prosternum narrow in front of procoxae. Mesosternum with a small, transverse, carinate process between and slightly in front of mesocoxae. Metasternum with slightly raised discal area; sides shallowly depressed. Profemur and mesofemur with dense, hydrofuge pubescence on basal two-thirds; apices glabrous. Metafemur finely, sparsely punctate; without dense pubescence except marginally along anterior third. Protarsus, mesotarsus, and metatarsus with basal segment shortest; second segment of mesotarsus and metatarsus slightly longer than third and fourth segments combined; fifth segment slightly shorter than second segment. Metatrochanter moderately elongate and pubescent.

**Abdomen.**—First and second abdominal sterna with a common, deep concavity. First sternum shiny; with numerous, very long, golden, hairlike setae along anterior margin and extending posteriorly as far as third sternum and holding a hyaline mass in concavity. Midline feebly raised longitudinally on first and second sterna. Sterna 3, 4, and 5 covered with short, dense, golden setae; fifth sternum rounded, not emarginate apicomediaally.

**Male genitalia.**—As illustrated (Figs. 1, 2).

**Female.**—Unknown.

**Type data.**—Holotype male: GUYANA: Mazaruni-Potaro District: Takutu Mountains, 6°15'N, 59°05'W, 18 Dec 1983, P. J. Spangler, M. Levine, E. Vystrcil; deposited in the National Museum of Natural History, Smithsonian Institution. Paratype: Same data as holotype, 1 male.

**Etymology.**—On weekends, when guyanese gold miners would arrive in town late in the evening after stores were closed, the hungry miners would knock on the doors and demand to buy pork and other food. Sometimes, with their new-found wealth, they would buy the entire contents of the store. Consequently, those miners earned

the name "pork-knockers." This new species is named for the friendly gold miners who were panning gold in the lower reaches of the stream from which we "mined" this and other new species of aquatic beetles.

*Habitat.*—The specimens were obtained by placing leaves in berlese funnels and recovering the specimens from the berleseate. The wet, rotting leaves were collected from the margin of a small brook heavily shaded by the rainforest.

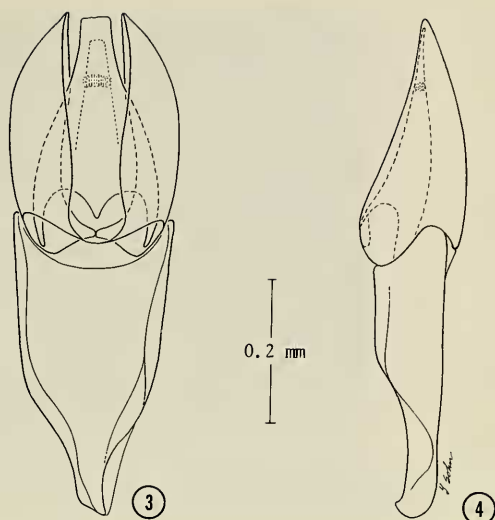
*Chaetarthria ayacuchana*, new species

Figs. 3–5

*Holotype male.*—Body form: Very convex, hemispherical. Length, 1.24 mm; greatest width, 1.0 mm, at about midlength.

*Color.*—Black dorsally except reddish brown around margins of pronotum and lateral margins of elytra. Ventral surface of head dark reddish brown except antennae and palpi light yellowish brown; remainder of venter light reddish brown.

*Head.*—With moderately coarse, sparse punctures; punctures between eyes separated by 2 to 4 times their diameter; punctures slightly more dense along inner margin of each eye. Clypeus with lateral margins moderately arcuate and rimmed; anterior margin shallowly, broadly emarginate. Labrum more distinctly punctate than head and almost truncate anteriorly. Eyes almost round viewed dorsally but oblong viewed laterally; shallowly emarginate where clypeus extends into anterior margin of eye. Ventral surface of head microalutaceous behind eyes. Mentum smooth and shiny, strongly rounded apically. Submentum finely, sparsely punctate between maxillae. Antenna, 8 segmented; basal segment long, sinuous; second segment almost globular; third, fourth, and fifth segments slender, platelike; sixth, seventh, and eighth segments increasingly larger; sixth segment with few setae apically; seventh and eighth segments with long, rather dense setae; eighth segment ending



Figs. 3 and 4. *Chaetarthria ayacuchana*, n. sp.; male genitalia. 3, Dorsal view. 4, Lateral view.

in slender apical projection about one-sixth as long as swollen basal part. Maxillary palpus, 4 segmented; basal segment tiny; second (pseudobasal) segment swollen and almost as long as apical segment; third segment one-third as long as second segment; apical segment longest; pseudobasal segment when lying along stipes not attaining base of stipes. Labial palpus, 3 segmented; basal segment very small; second segment longest and bearing numerous, long, golden setae medially and 1 near apex laterally; apical segment about one-fourth shorter than second segment and bearing numerous, long, golden setae medially and 3 long, golden, hair-like setae dorsally just before apex.

*Thorax.*—Pronotum strongly convex; sides, posterolateral angles, and anterolateral angles moderately rounded; lateral margins finely rimmed; anterior margin arcuate medially and slightly angulate behind eyes; punctures on disc moderately coarse, sparse, separated by 4 to 8 times their diameter. Scutellum an equilateral triangle. Elytron 0.97 mm long; strongly convex; widest near midlength; distinctly rimmed along base laterally; lateral margins finely



Fig. 5. *Chaetarthria ayacuchana*, n. sp.; biotope. "Tobogán" area, 40 km south of Puerto Ayacucho, T.F. Amazonas, Venezuela.

rimmed, slightly sinuate in lateral view; seta-bearing punctures on disc coarse, distinct, and rather dense and much more coarse and dense than those on pronotum, separated by 3 to 4 times their diameter; sutural stria deep, extending and widening from slightly before midlength to apex; sides strongly declivous, without obvious epipleura. Metathoracic wings present. Prosternum, mesosternum, and metasternum glabrous and shiny. Prosternum narrow in front of procoxae. Mesosternum with small, transverse, carinate process between and slightly in front of mesocoxae. Metasternum with slightly raised discal area; sides shallowly depressed. Procoxa with 5 very stout spines apicoventrally. Profemur with dense, hydrofuge pubescence on basal two-thirds; apices glabrous. Mesofemur with fine, sparse, seta-bearing punctures; punctures denser along anterior third. Metafemur with fine, sparse, seta-bearing punctures marginally along anterior third. Protarsus, mesotarsus, and metatarsus with basal segment shortest; second segment of mesotarsus and metatarsus slightly longer than third and fourth segments combined; fifth segment

slightly shorter than second segment. Metatrochanter moderately elongate and sparsely pubescent.

*Abdomen.*—First and second abdominal sterna with a common, deep concavity. First sternum shiny; with numerous, very long, golden, hairlike setae along anterior margin and extending posteriorly as far as third sternum and holding a hyaline mass in concavity. Midline feebly raised longitudinally on first and second sterna. Sterna 3, 4, and 5 covered with short, sparse, golden setae; fifth sternum rounded, not emarginate apicomediaally.

*Male genitalia.*—As illustrated (Figs. 3, 4).

*Female.*—Similar to male except length of female is greater.

*Type data.*—Holotype: VENEZUELA: Territorio Federal Amazonas: Puerto Ayacucho (40 km S) at "Tobogán," 22 Jan 1985, P. J. and P. M. Spangler, R. A. Faitoute, W. E. Steiner; deposited in the National Museum of Natural History, Smithsonian Institution. Allotype: Same data as holotype. Paratypes: Same data as holotype, 3 males, 4 females; same locality, 25 Feb 1986, P. J.

Spangler, 1 male; same locality, 27 Feb 1986, P. J. Spangler, 1 male. Paratypes deposited in the Instituto de Zoología Agrícola, Facultad de Agronomía, Maracay, Venezuela, and the British Museum (Natural History), London.

**Etymology.**—The trivial epithet *ayacu-chana* (adjective) is named for the town near which this new species was collected.

**Habitat.**—Enroute to Cerro de la Neblina, the participants in the expedition had to layover in Puerto Ayacucho for two days awaiting air transportation. During that time we visited an interesting area about 40 km south of Puerto Ayacucho known locally as the "Tobogán"; so named because water running over an extensive area of bedrock had polished the rock and formed a slide-like channel on one side of the outcropping. The water dropped into a pool at the base of the slide area and drained away in a shallow stream with a sandy substratum. Collections of aquatic insects were made from the stream and its sandy margins. The type specimens of *C. ayacu-chana* were collected from the sandy margins in the sunny part of the stream before it entered the shade of the forest (Fig. 5). Colorimetric water chemistry tests provided the following data: Oxygen, 15 ppm; pH, 6; hardness, 0. The water temperature was 28°C and the air temperature was 37°C at the time the data were collected.

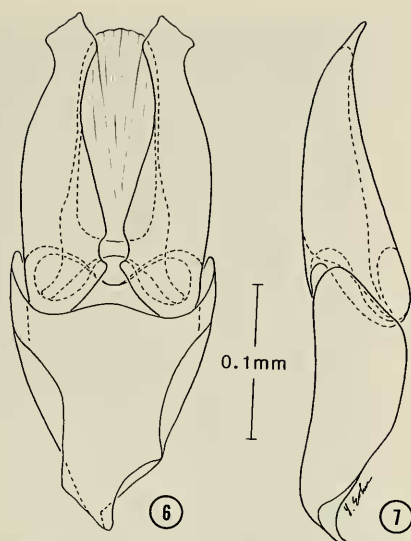
*Chaetarthria gabilana*, new species

Figs. 6–8

**Holotype male.**—Body form: Very convex, hemispherical. Length, 1.54 mm; greatest width, 1.04 mm, at about mid-length.

**Color.**—Black dorsally except reddish brown around margins of pronotum. Ventral surface of head, thorax, abdomen and appendages reddish brown.

**Head.**—With moderately coarse, sparse punctures; punctures between eyes separated by 4 to 6 times their diameter; slightly



Figs. 6 and 7. *Chaetarthria gabilana*, n. sp.; male genitalia. 6, Dorsal view. 7, Lateral view.

alutaceous along inner margin of each eye. Clypeus with lateral margins moderately arcuate and rimmed; anterior margin shallowly, broadly emarginate. Labrum more distinctly punctate than head; almost truncate; with short, dense fringe of setae anteromedially. Eyes almost round viewed dorsally but oblong viewed laterally; shallowly emarginate where clypeus extends into anterior margin of eye. Ventral surface of head microalutaceous behind eyes. Mentum and submentum finely, sparsely punctate between maxillae. Antenna, 8 segmented; basal segment long, sinuous; second segment almost globular; third, fourth, and fifth segments slender, platelike; sixth, seventh, and eighth segments increasingly larger; sixth segment with few setae apicolaterally; seventh and eighth segments with long, rather dense setae; eighth segment ending in narrow elongate apical projection longer than swollen basal part. Maxillary palpus, 4 segmented; basal segment tiny; second (pseudobasal) segment swollen apically and almost as long as apical segment; third segment slightly more than half as long as second segment; apical segment about a sixth long-



Fig. 8. *Chaetarthria gavilana*, n. sp.; biotope. Caño near the village of Gavilán, 35 km southeast of Puerto Ayacucho, T.F. Amazonas, Venezuela.

er than second segment; pseudobasal segment when lying along stipes not attaining base of stipes. Labial palpus, 3 segmented; basal segment very small; second segment longest; both basal and second segments bearing numerous, long, golden setae especially on medial and lateral surfaces; apical segment about one-fourth shorter than second segment and bearing several, long, golden setae subapically and 3 long, golden, hairlike setae dorsally on apex.

*Thorax*. — Pronotum strongly convex; sides, posterolateral angles, and anterolateral angles moderately rounded; lateral margins finely rimmed; anterior margin arcuate medially and angulate behind eyes; punctures on disc moderately coarse, sparse, separated by 4 to 8 times their diameter. Scutellum an equilateral triangle; very finely and sparsely punctate. Elytron 1.15 mm long; strongly convex; widest near mid-length; distinctly rimmed along base laterally; lateral margins finely rimmed, slightly sinuate in lateral view; seta-bearing punctures on disc coarse, distinct, and rather

dense and much more coarse and dense than those on pronotum, separated by 3 to 4 times their diameter; punctures on sides of elytra very coarse; sutural stria deep, extending and widening from slightly before mid-length to apex; sides strongly declivous, without obvious epipleura. Metathoracic wings present. Prosternum, mesosternum, and metasternum mostly glabrous and shiny; metasternal disc with sparse, fine punctures. Prosternum narrow in front of procoxae. Mesosternum with small, transverse, carinate process between and slightly in front of mesocoxae. Metasternum with slightly raised discal area; sides shallowly depressed. Procoxa with 3 very stout spines apicoventrally. Profemur and mesofemur with dense, hydrofuge pubescence on basal two-thirds; apices glabrous. Metafemur with fine, sparse, seta-bearing punctures marginally along anterior third. Protarsus, mesotarsus, and metatarsus with basal segment shortest; second segment of mesotarsus and metatarsus slightly longer than third and fourth segments combined; fifth segment

slightly shorter than second segment. Metatrochanter moderately elongate and sparsely pubescent.

*Abdomen.*—First and second abdominal sterna with a common, deep concavity. First sternum shiny; with numerous, very long, golden, hairlike setae along anterior margin and extending posteriorly as far as third sternum and holding a hyaline mass in concavity. Midline feebly raised longitudinally on first and second sterna. Sterna 3, 4, and 5 covered with short, sparse, golden setae; fifth sternum rounded, not emarginate apicomediaally.

*Male genitalia.*—As illustrated (Figs. 6, 7).

*Female.*—Unknown.

*Type data.*—Holotype: VENEZUELA: Territorio Federal Amazonas: Puerto Ayacucho (35 km SE), Gavilán area, 20 Feb 1986, P. J. Spangler and W. Sanchez; deposited in the National Museum of Natural History, Smithsonian Institution.

*Etymology.*—The trivial epithet *gavilana* (adjective) is named for the Indian village and river of the same name near which this new species was collected.

*Habitat.*—The specimen described above was collected from the sandy margins of an unnamed caño 2 km west of the village of Gavilán (35 km southeast of Puerto Ayacucho). The caño (Fig. 8) was about 0.5 m deep and 1 m wide. Colorimetric water chemistry tests provided the following data: Oxygen, 12 ppm; pH, 6; hardness, 0. The water temperature was 27°C and the air temperature was 37°C at the time the data were collected.

The following key should serve to distinguish the five species which key to couplet 41 in Miller's (1974) key.

- 1. Head, pronotum, and elytra shiny; punctures indistinct, extremely fine and sparse. Male genitalia as illustrated (Figs. 1, 2). Guyana .....  
..... *porkknockeri*, new species
- Head, pronotum, and elytra distinctly punctate ..... 2

- 2. Elytra with moderately coarse, moderately sparse, seta-bearing punctures on discal area; lateral punctures very coarse and dense, especially at midlength; setae arranged in widely separated rows. Male genitalia as illustrated (Figs. 6, 7). Venezuela .. *gavilana*, new species
- Elytra with fine or moderately coarse and moderately sparse, seta-bearing punctures on discal area; lateral punctures moderately coarse at midlength; setae in narrowly separated rows or scattered over surface ..... 3
- 3. Elytra with rows of moderately coarse, dense, seta-bearing punctures over entire surface; setae very dense; rows of punctures becoming substriate toward apex. Brazil ....  
..... *granulata* Miller
- Elytra with fine or moderately coarse punctures in indistinct rows or scattered over surface; without indications of any striae except sutural stria ..... 4
- 4. Elytra with discal area finely, sparsely punctate; moderately coarsely punctate laterally and toward apex. Brazil ..... *brasilia* Miller
- Elytra with discal area moderately coarsely, sparsely punctate; punctures becoming coarse laterally and toward apex. Male genitalia as illustrated (Figs. 3, 4). Venezuela ..  
..... *ayacuchana*, new species

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Matthew Stevens, and Edouard Vystřicil. I am deeply grateful and thank all of the contributors for their help in making that fieldwork possible.

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of the above organizations and their administrators for their extensive contributions to this biotic survey.

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